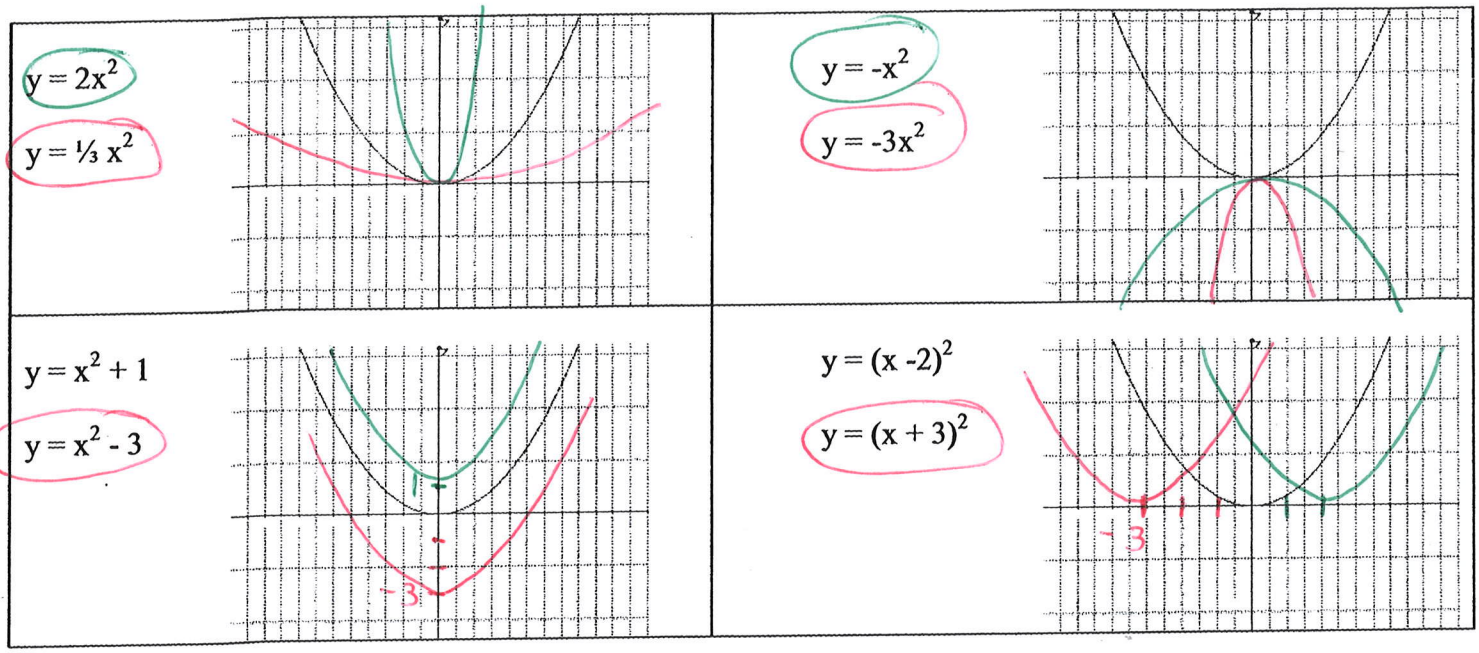
Year 10 General Maths – FO – Quadratic Modelling - Worksheet 5
Sketching Parabolas Given in Turning Point Form

We have seen that quadratic equations can be expressed in an expanded form or factorized form. For example :

Expanded : $y = x^2 + 2x - 8$ The same equation factorized : $y = (x + 4)(x - 2)$

A third way in which quadratic equations can be expressed is called 'Turning point form'. We will see later why it gets this title. In this example, the turning point version is : $y = (x + 1)^2 - 9$

In each of the following cases, plot the parabola $y = x^2$ on your calculator. Then plot the other two graphs on your calculator also, noting how they compare to the graph of $y = x^2$. Draw a sketch on the axes provided below to show how the 2 new graphs compare to $y = x^2$.



The arrows below point to the various sections of a quadratic expressed in turning point form. For each arrow, describe the effect that section has on the appearance and position of the parabola on the graph.

t.p. = turning point

$$Y = \pm a (x \pm b)^2 \pm c$$

+V min
-∧ max
doesn't affect t.p.
(reflection in x-axis)

a>1 graph narrower
0<a<1 graph wider
a=1 graph same
doesn't affect t.p.
(dilation)

+b moves 'b' spaces left
-b moves 'b' spaces right
x coord of t.p
(translation)

+c moves 'c' spaces up
- c moves 'c' spaces do
y coord of t.p.
(translation)